

**Abstract**

A data transmission system compensates Doppler shift in a telecommunication system in which system at least one user terminal is moving in relation to a network element. The system includes means for measuring a received uplink signal, and means for estimating the amount of Doppler frequency compensation for at least one downlink signal related to the user terminal on the basis of the measured received uplink signal. Means are provided for compensating the Doppler shift for at least one downlink signal related to the user terminal by shifting the frequency of the signal according to the estimated amount of Doppler frequency compensation.